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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

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Applicant(s): Alan P. Kozikowski *et al.*

Examiner: Celia C. Chang

Application No.: 10/576,620

Art Unit: 1625

Filed: March 8, 2007

Atty. Docket No.: **GUX-010.01**

Title: *Dopamine-, Norepinephrine-, and Serotonin-Transporter-Selective Heterocyclic Compounds and Their Therapeutic Applications*

Confirmation No: 4324

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**AMENDMENT & RESPONSE**

Dear Examiner Chang:

In response to the Final Office Action in the above-identified application, which was dispatched on August 26, 2011, the Applicants submit this paper. No new matter has been added.

**Amendments to the Claims** begin on page 2.

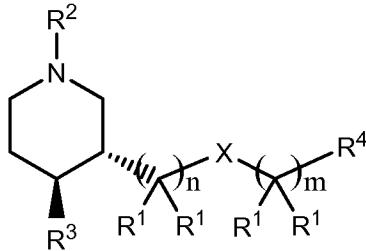
**Remarks** begin on page 8.

## EXAMINER'S AMENDMENT

CLAIMS

This listing of the claims will replace all prior versions and listings of the claims in the application.

1. (currently amended) A compound represented by formula I:

**I**

wherein

$R^1$  represents independently for each occurrence H or alkyl;

$R^2$  is H, alkyl, aryl, aralkyl, or  $-C(O)R^5$ ;

$R^3$  is <sup>optionally substituted</sup> aryl, heteroaryl, or aralkyl;

$R^4$  is ~~hydrogen, hydroxyl, aryl, heteroaryl, OR<sup>5</sup>, CO<sub>2</sub>R<sup>6</sup>, C(O)N(R<sup>6</sup>)<sub>2</sub>, C(O)NHOH, OC(O)R<sup>5</sup>, or oxadiazole~~;

$R^5$  is alkyl, aryl, heteroaryl, or aralkyl;

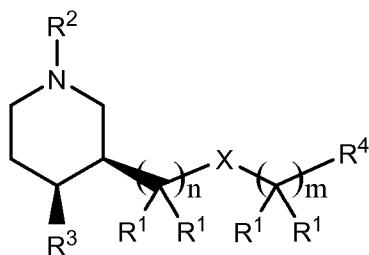
$R^6$  represents independently for each occurrence hydrogen, alkyl, aryl, or aralkyl, wherein any two instances of  $R^6$  may be covalently attached to form a ring;

X is S,  $-S(O)-$ , or  $-S(O_2)-$ ;

n is 1, 2, 3, or 4; and

m is 1, 2, 3, or 4.

2. (currently amended) A compound represented by formula II:



II

wherein

$R^1$  represents independently for each occurrence H or alkyl;

$R^2$  is H, alkyl, aryl, aralkyl, or  $-C(O)R^5$ ;

$R^3$  is <sup>optionally substituted</sup> aryl, heteroaryl, or aralkyl;

$R^4$  is ~~hydrogen, hydroxyl, aryl, heteroaryl, OR<sup>5</sup>, CO<sub>2</sub>R<sup>6</sup>, C(O)N(R<sup>6</sup>)<sub>2</sub>, C(O)NHOH, OC(O)R<sup>5</sup>, or oxadiazole~~;

$R^5$  is alkyl, aryl, heteroaryl, or aralkyl;

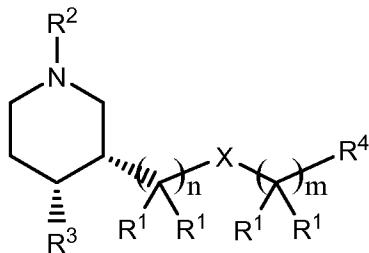
$R^6$  represents independently for each occurrence hydrogen, alkyl, aryl, or aralkyl, wherein any two instances of  $R^6$  may be covalently attached to form a ring;

$X$  is S,  $-S(O)-$ , or  $-S(O_2)-$ ;

$n$  is 1, 2, 3, or 4; and

$m$  is 1, 2, 3, or 4.

3. (currently amended) A compound represented by formula III:



III

wherein

$R^1$  represents independently for each occurrence H or alkyl;

$R^2$  is H, alkyl, aryl, aralkyl, or  $-C(O)R^5$ ;

optionally substituted

$R^3$  is aryl, heteroaryl, or aralkyl;

$R^4$  is ~~hydrogen, hydroxyl, aryl, heteroaryl, OR<sup>5</sup>, CO<sub>2</sub>R<sup>6</sup>, C(O)N(R<sup>6</sup>)<sub>2</sub>, C(O)NHOH,~~

~~OC(O)R<sup>5</sup>, or oxadiazole;~~

$R^5$  is alkyl, aryl, heteroaryl, or aralkyl;

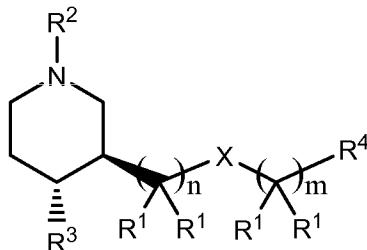
$R^6$  represents independently for each occurrence hydrogen, alkyl, aryl, or aralkyl, wherein any two instances of  $R^6$  may be covalently attached to form a ring;

$X$  is S,  $-S(O)-$ , or  $-S(O_2)-$ ;

$n$  is 1, 2, 3, or 4; and

$m$  is 1, 2, 3, or 4.

4. **(currently amended)** A compound represented by formula **IV**:



**IV**

wherein

$R^1$  represents independently for each occurrence H or alkyl;

$R^2$  is H, alkyl, aryl, aralkyl, or  $-C(O)R^5$ ;

optionally substituted

$R^3$  is aryl, heteroaryl, or aralkyl;

$R^4$  is ~~hydrogen, hydroxyl, aryl, heteroaryl, OR<sup>5</sup>, CO<sub>2</sub>R<sup>6</sup>, C(O)N(R<sup>6</sup>)<sub>2</sub>, C(O)NHOH,~~

~~OC(O)R<sup>5</sup>, or oxadiazole;~~

$R^5$  is alkyl, aryl, heteroaryl, or aralkyl;

$R^6$  represents independently for each occurrence hydrogen, alkyl, aryl, or aralkyl, wherein any two instances of  $R^6$  may be covalently attached to form a ring;

X is S, -S(O)-, or -S(O<sub>2</sub>)-;

n is 1, 2, 3, or 4; and

m is 1, 2, 3, or 4.

Claims 5-23 (canceled)

<sup>5</sup>~~24.~~ (original) The compound of claim 2, wherein X is S or -S(O)-.

<sup>6</sup>~~25.~~ (original) The compound of claim 2, wherein  $R^2$  is methyl, ethyl or propyl.

<sup>7</sup>~~26.~~ (original) The compound of claim 2, wherein  $R^2$  is methyl.

<sup>8</sup>~~27.~~ (currently amended) The compound of claim 2, wherein  $R^3$  is ~~aryl~~ <sup>optionally</sup> substituted phenyl.

<sup>9</sup>~~28.~~ (currently amended) The compound of claim [[2]] <sup>8</sup>~~27~~, wherein  $R^3$  is halophenyl.

<sup>10</sup>~~29.~~ (currently amended) The compound of claim [[2]] <sup>8</sup>~~27~~, wherein  $R^3$  is 3-chlorophenyl.

30. (canceled)

<sup>11</sup>~~31.~~ (currently amended) The compound of claim 2, wherein  $R^4$  is ~~C(O)N(R<sup>6</sup>)<sub>2</sub>~~ and  $R^6$  represents independently for each occurrence hydrogen or alkyl.

<sup>12</sup>~~32.~~ (original) The compound of claim 2, wherein X is S, n is 1, m is 1,  $R^1$  is hydrogen,  $R^2$  is methyl, and  $R^3$  is 3-chlorophenyl.

33. (canceled)

<sup>13</sup>~~34.~~ (original) The compound of claim 2, wherein X is S, n is 1, m is 1,  $R^1$  is hydrogen,  $R^2$  is methyl,  $R^3$  is 3-chlorophenyl, and  $R^4$  is C(O)N(H)iPr.

<sup>14</sup>~~35.~~ (original) The compound of claim 3, wherein X is S or -S(O)-.

<sup>15</sup>~~36.~~ (original) The compound of claim 3, wherein  $R^2$  is methyl, ethyl or propyl.

<sup>16</sup>~~37.~~ (original) The compound of claim 3, wherein  $R^2$  is methyl.

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38. **(currently amended)** The compound of claim 3, wherein R<sup>3</sup> is ~~aryl~~ <sup>optionally</sup> substituted phenyl <sup>optionally</sup> substituted phenyl.

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39. **(currently amended)** The compound of claim [[3]] <sup>17</sup> ~~38~~, wherein R<sup>3</sup> is halophenyl.

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40. **(currently amended)** The compound of claim [[3]] <sup>17</sup> ~~38~~, wherein R<sup>3</sup> is 3-chlorophenyl.

41. **(canceled)**

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42. **(currently amended)** The compound of claim 3, wherein R<sup>4</sup> is ~~C(O)N(R<sup>6</sup>)<sub>2</sub>~~ and R<sup>6</sup> represents independently for each occurrence hydrogen or alkyl.

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43. **(original)** The compound of claim 3, wherein X is S, n is 1, m is 1, R<sup>1</sup> is hydrogen, R<sup>2</sup> is methyl, and R<sup>3</sup> is 3-chlorophenyl.

44. **(canceled)**

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45. **(original)** The compound of claim 3, wherein X is S, n is 1, m is 1, R<sup>1</sup> is hydrogen, R<sup>2</sup> is methyl, R<sup>3</sup> is 3-chlorophenyl, and R<sup>4</sup> is C(O)N(H)iPr.

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46. **(original)** The compound of claim 4, wherein X is S or -S(O)-.

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47. **(original)** The compound of claim 4, wherein R<sup>2</sup> is methyl, ethyl or propyl.

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48. **(original)** The compound of claim 4, wherein R<sup>2</sup> is methyl.

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49. **(currently amended)** The compound of claim 4, wherein R<sup>3</sup> is ~~aryl~~ <sup>optionally</sup> substituted phenyl <sup>optionally</sup> substituted phenyl.

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50. **(currently amended)** The compound of claim [[4]] <sup>26</sup> ~~49~~, wherein R<sup>3</sup> is halophenyl.

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51. **(currently amended)** The compound of claim [[4]] <sup>26</sup> ~~49~~, wherein R<sup>3</sup> is 3-chlorophenyl.

52. **(canceled)**

29  
53. **(currently amended)** The compound of claim 4, wherein R<sup>4</sup> is ~~C(O)N(R<sup>6</sup>)<sub>2</sub>~~ and R<sup>6</sup> represents independently for each occurrence hydrogen or alkyl.

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54. **(original)** The compound of claim 4, wherein X is S, n is 1, m is 1, R<sup>1</sup> is hydrogen, R<sup>2</sup> is methyl, and R<sup>3</sup> is 3-chlorophenyl.

55. **(canceled)**

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56. (original) The compound of claim 4, wherein X is S, n is 1, m is 1, R<sup>1</sup> is hydrogen, R<sup>2</sup> is methyl, R<sup>3</sup> is 3-chlorophenyl, and R<sup>4</sup> is C(O)N(H)iPr.

Claims 57-107(canceled)

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108. (previously presented) The compound of claim 1, wherein X is S or -S(O)-.

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109. (previously presented) The compound of claim 1, wherein R<sup>2</sup> is methyl, ethyl or propyl.

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110. (previously presented) The compound of claim 1, wherein R<sup>2</sup> is methyl.

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111. (currently amended) The compound of claim 1, wherein R<sup>3</sup> is ~~aryl~~<sup>optionally</sup> substituted phenyl

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112. (currently amended) The compound of claim [[1]] ~~111~~<sup>35</sup>, wherein R<sup>3</sup> is halophenyl.

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113. (currently amended) The compound of claim [[1]] ~~111~~<sup>35</sup>, wherein R<sup>3</sup> is 3-chlorophenyl.

114. (canceled)

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115. (currently amended) The compound of claim 1, wherein R<sup>4</sup> is C(O)N(R<sup>6</sup>)<sub>2</sub> and R<sup>6</sup> represents independently for each occurrence hydrogen or alkyl.

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116. (previously presented) The compound of claim 1, wherein X is S, n is 1, m is 1, R<sup>1</sup> is hydrogen, R<sup>2</sup> is methyl, and R<sup>3</sup> is 3-chlorophenyl.

117. (canceled)

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118. (previously presented) The compound of claim 1, wherein X is S, n is 1, m is 1, R<sup>1</sup> is hydrogen, R<sup>2</sup> is methyl, R<sup>3</sup> is 3-chlorophenyl, and R<sup>4</sup> is C(O)N(H)iPr.